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## Practice-based insights from UK collaboration projects between a university and communities: ideas for school-based learning through citizen science

### Conference or Workshop Item

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[oro.open.ac.uk](https://oro.open.ac.uk)

Practice-based insights from UK collaboration  
projects between a university and communities  
*ideas for school-based learning through citizen  
science*

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Faculty of STEM, The Open University, UK

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# Presentation Outline

- The Open University and citizen science
- OU biodiversity citizen science projects summaries
- Evolution Megalab
  - Engaging schools in research
- iSpot your place to share nature
  - iSpot participation, engagement and learning
  - School-based experiences: iSpot projects
  - Support: Citizen science and Global biodiversity course
  - Join a live and growing online community
- Treezilla: creating a UK map of trees
  - Contribute to the monster map of trees
  - School-based experiences : student –led research
- X:PolliNation: ideas, methods & technologies for pollinator citizen science
  - XPolli actionable CS cycle
  - School-based experiences support: resources for all
- Cos4Cloud, an European project to boost citizen science technologies
  - What is a citizen observatory?
  - Join the Cos4Cloud community
- iSpot citizen science learning curve
  - CS learning design five-step model
- OU online citizen science learning communities - *opportunities for school-based learning*

# OU citizen science, research and learning

## The OU:

- Britain's main e-learning institution, leader in distance learning
- Develops innovative educational technology
- Integrates citizen science, open science, practical science (online) within STEM pedagogy

## Citizen Science research

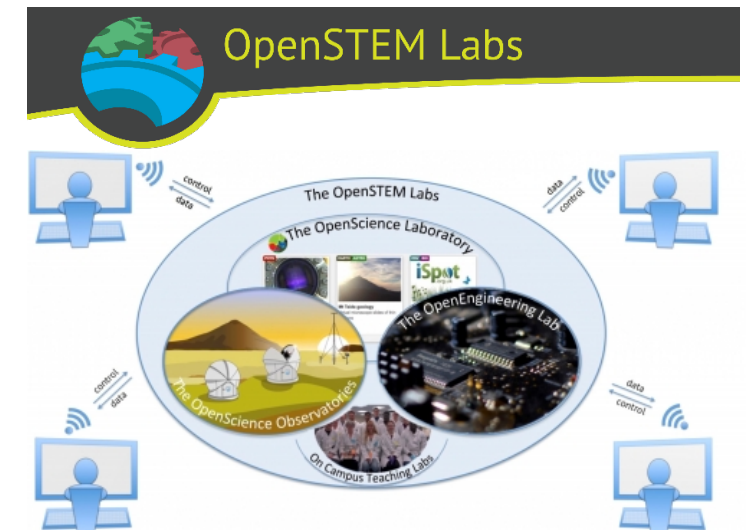
- Monitoring, classifying and collecting data at scale
- Infrastructure for collating and analysing data
- Citizen science, policy and action

## Citizen science learning and teaching

- Collaborative and informal learning opportunities
- Opportunities for student projects
- Citizen inquiry

## Knowledge exchange

- Outreach and public engagement
- Building new collaborations



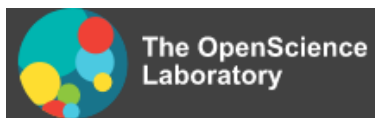
# OU biodiversity citizen science projects



European-wide citizen science project on species evolutionary trends recording snails.



[www.iSpotnature.org](http://www.iSpotnature.org) Your place to share nature: sharing & learning about wildlife, while building species identification skills.



Practical science, online experiments, citizen science activities etc.  
[www.opensciencelab.ac.uk](http://www.opensciencelab.ac.uk)



The monster map of trees: cataloguing UK trees, calculates ecosystem service values [www.Treezilla.org](http://www.Treezilla.org)



Cross pollinating ideas, methods and technologies for pollinator citizen science: <https://xpollination.org>



Co-designed Citizen Observatories Services for the European Open Science Cloud: a European project to boost citizen science technologies [www.cos4cloud-eosc.eu/](http://www.cos4cloud-eosc.eu/)



DECIDE: Recording nature where it matters  
<https://www.ceh.ac.uk/our-science/projects/decide>



Sensory Explorations of Nature in School Environments  
<http://kmi.open.ac.uk/projects/name/sense>

2009

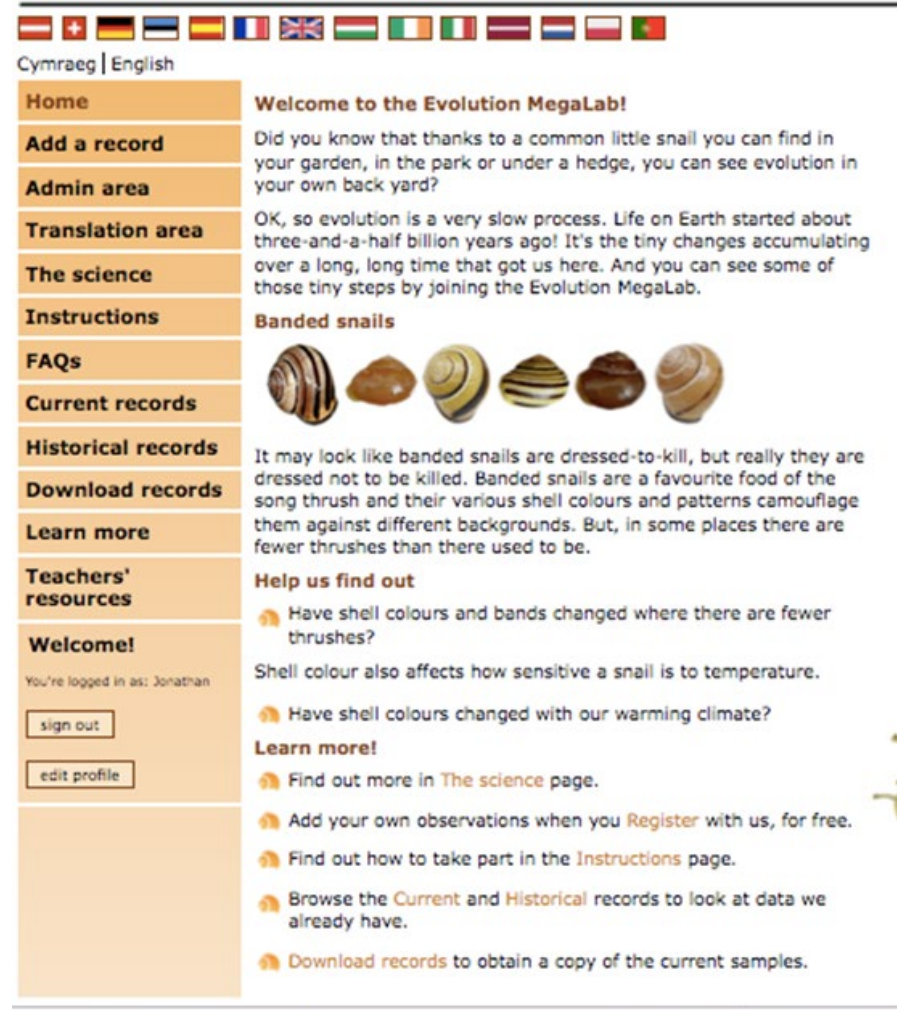
2013

2019

2020

2021

- **Scale:** European, 14 countries
- **Timeline:** 2009 – 2010: 200th anniversary Darwin's birth; 150th anniversary of *Origin of Species*
- **Focus:** public survey of banded snails
- **Aim / hypothesis:** evolutionary responses to climate change
- **Website features:** historic records 1930 – 1980; new data posted by the public
- **Engagement, teaching & learning:** Quizzes, ID guides, school activities, events & activities; media; different languages





~ 5,000,000 total media outreach (UK only)

71,232 hits to website

6461 registered users

2472 users submitted a record

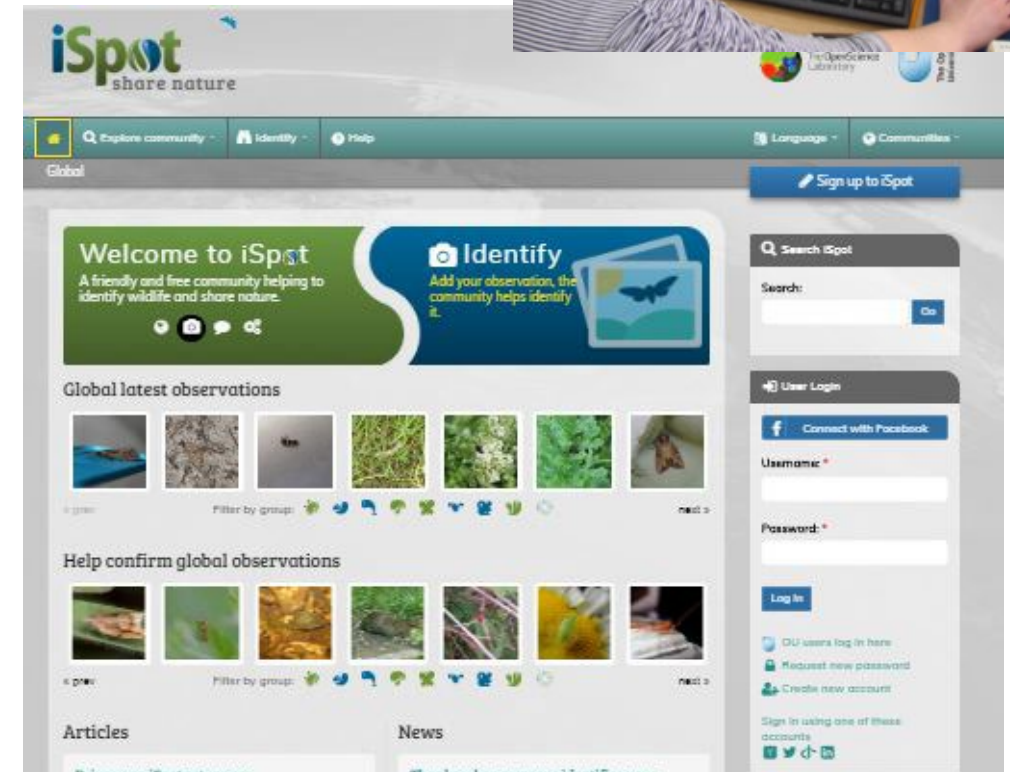
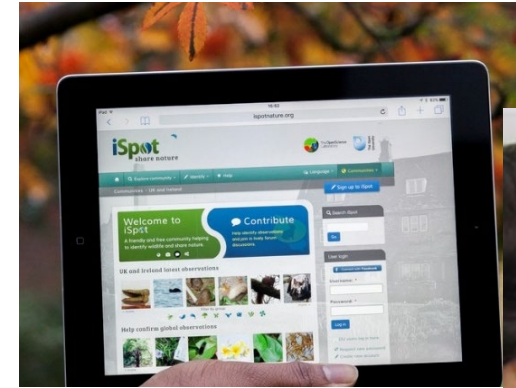
7629 records submitted

public, schools, universities scientists



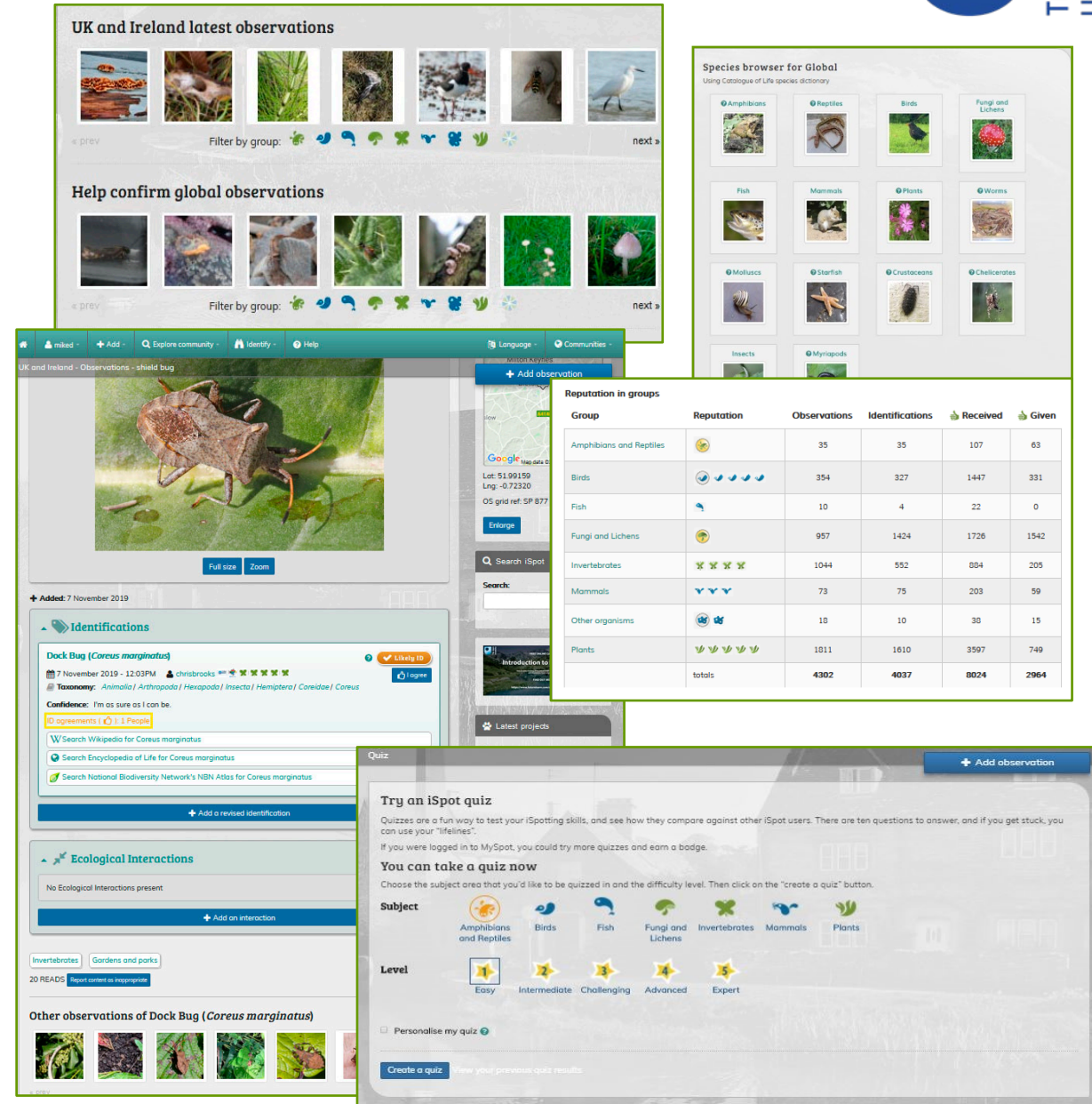
[www.iSpotnature.org](http://www.iSpotnature.org): A citizen science platform for **identifying** and **learning** about biodiversity. Anyone can upload a photo and the community of users help to identify it.

- **Scale:** UK / Global citizen science platform for biodiversity
- **Timeline:** 2009 – ongoing
- **Aims:**
  - Lower barriers to ID – build ID skills
  - Make nature accessible / open to all
  - A new generation of naturalists
  - Biological data recording
- **Website features:** **global**, national species dictionaries, innovative technology, integrated tools etc
- **Engagement, teaching & learning:** Media, radio & TV (OU/BBC), social media, events & activities with schools, community groups etc (iSpot Mentors); tools, resources and courses contributing to informal and formal learning





- **Explore:** Browse iSpot observations
- **Identify:** Register & post, use species dictionary & browser, etc
- **Contribute:** Give IDs, agreements, comments, forums, gain reputation points
- **Personalise:** create project filters, collate your observations
- **Recognition:** quizzes (assessment) & courses, etc



**UK and Ireland latest observations**

Filter by group: [Icons]

**Help confirm global observations**

Filter by group: [Icons]

**Species browser for Global**  
Using Catalogue of Life species dictionary

- Amphibians
- Reptiles
- Birds
- Fungi and Lichens
- Fish
- Mammals
- Plants
- Worms
- Molluscs
- Starfish
- Crustaceans
- Chelicerates
- Insects
- Myriapods

**Reputation in groups**

| Group                   | Reputation | Observations | Identifications | Received    | Given       |
|-------------------------|------------|--------------|-----------------|-------------|-------------|
| Amphibians and Reptiles | [Icons]    | 35           | 35              | 107         | 63          |
| Birds                   | [Icons]    | 354          | 327             | 1447        | 331         |
| Fish                    | [Icons]    | 10           | 4               | 22          | 0           |
| Fungi and Lichens       | [Icons]    | 957          | 1424            | 1726        | 1542        |
| Invertebrates           | [Icons]    | 1044         | 552             | 804         | 205         |
| Mammals                 | [Icons]    | 73           | 75              | 203         | 59          |
| Other organisms         | [Icons]    | 18           | 10              | 30          | 15          |
| Plants                  | [Icons]    | 1011         | 1610            | 3597        | 749         |
| <b>Totals</b>           |            | <b>4302</b>  | <b>4037</b>     | <b>8024</b> | <b>2964</b> |

**Quiz**

**Try an iSpot quiz**

Quizzes are a fun way to test your iSpotting skills, and see how they compare against other iSpot users. There are ten questions to answer, and if you get stuck, you can use your "lifelines".

If you were logged in to MySpot, you could try more quizzes and earn a badge.

**You can take a quiz now**

Choose the subject area that you'd like to be quizzed in and the difficulty level. Then click on the "create a quiz" button.

**Subject**

- Amphibians and Reptiles
- Birds
- Fish
- Fungi and Lichens
- Invertebrates
- Mammals
- Plants

**Level**

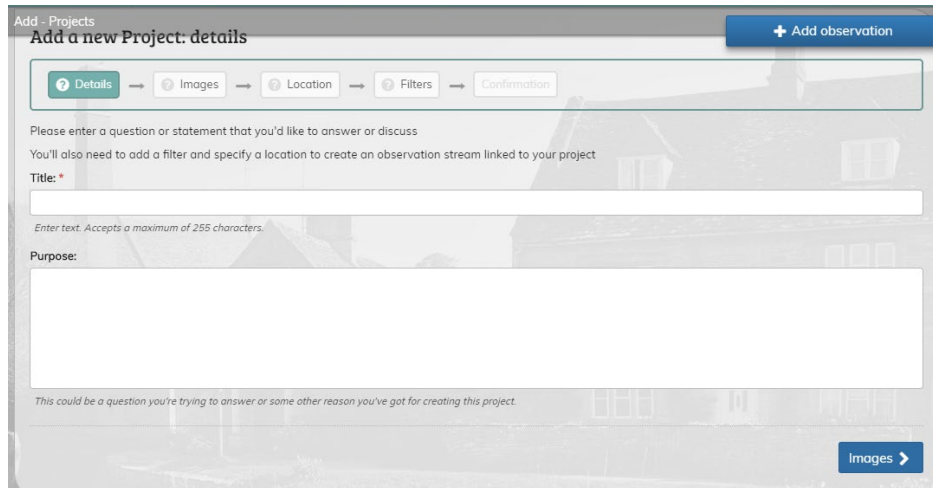
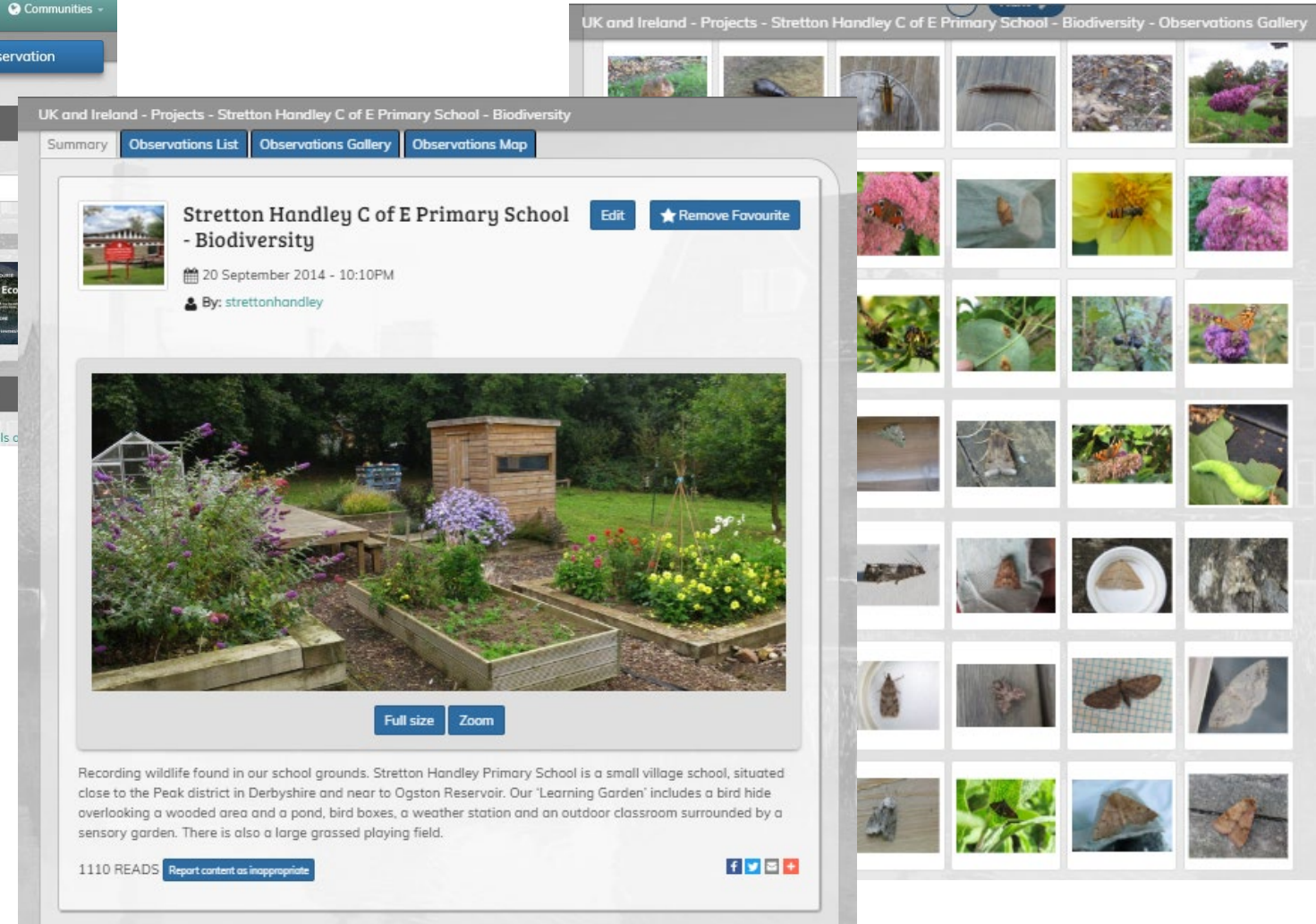
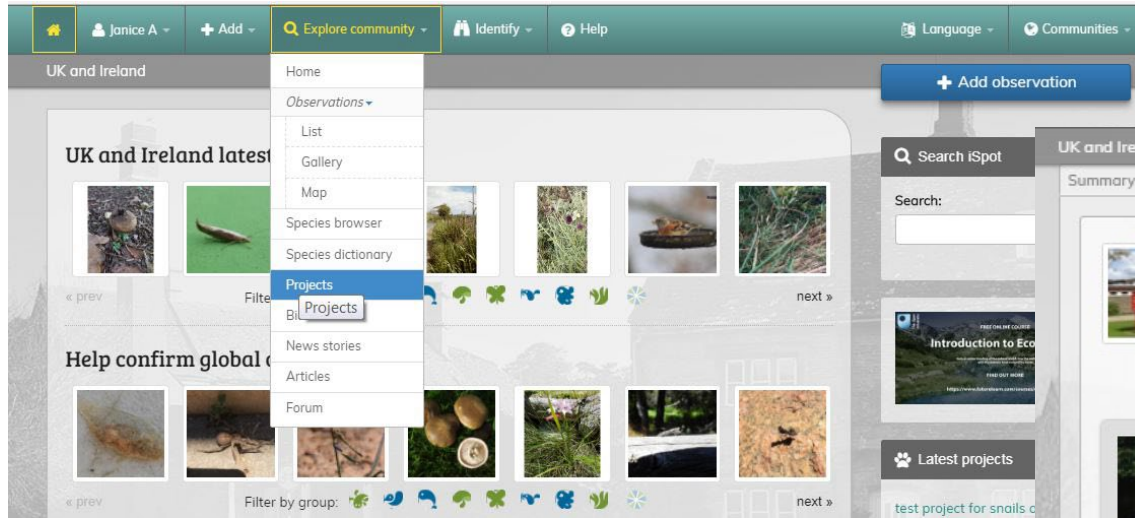
- 1 Easy
- 2 Intermediate
- 3 Challenging
- 4 Advanced
- 5 Expert

☐ Personalise my quiz

**Create a quiz** [View your previous quiz results](#)

# School-based experiences: iSpot Projects

Create filters to view, collect, collate, share, propose research queries and learn



Stretton Handley Primary School – Biodiversity project: [www.ispotnature.org/communities/uk-and-ireland/view/project/284782/stretton-handley-c-of-e-primary-school-biodiversity](http://www.ispotnature.org/communities/uk-and-ireland/view/project/284782/stretton-handley-c-of-e-primary-school-biodiversity)



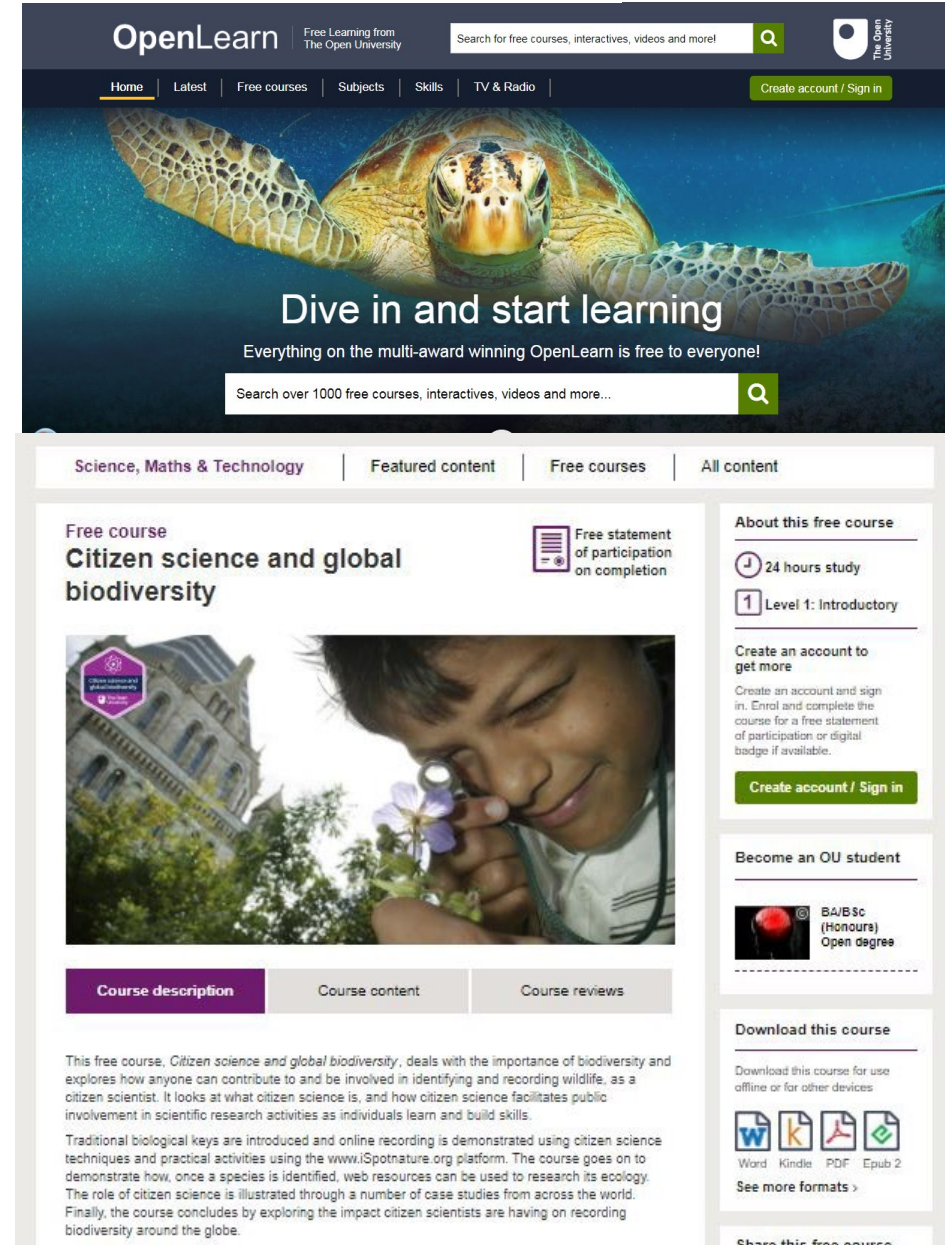
**OpenLearn** ([www.open.edu/openlearn](http://www.open.edu/openlearn)): Free 8 week Badged Open Course (BOC)

Citizen science and global biodiversity:

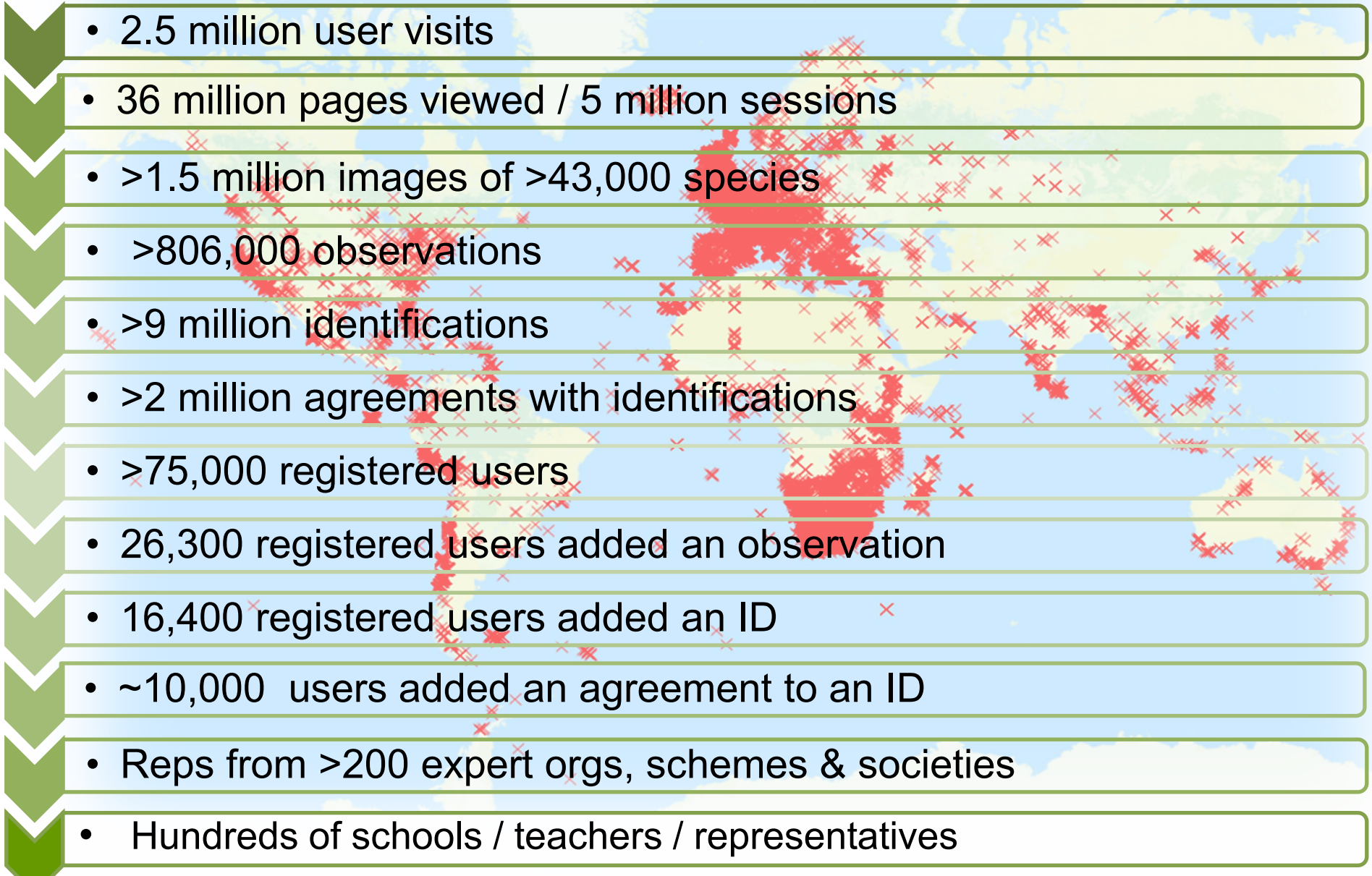
[www.open.ac.uk/citizen-science-and-global-biodiversity](http://www.open.ac.uk/citizen-science-and-global-biodiversity)

Highlights the importance of biodiversity and how anyone can contribute, identify and record wildlife, as a citizen scientist:

- What is citizen science its growth and link to biological recording
- Scientific research activities as you learn and build individual skills.
- Traditional biological keys and online recording using citizen science techniques
- Practical activities using [www.iSpotnature.org](http://www.iSpotnature.org)
- Using web resources to research species ecology
- The impact of citizen science on biodiversity around the globe.

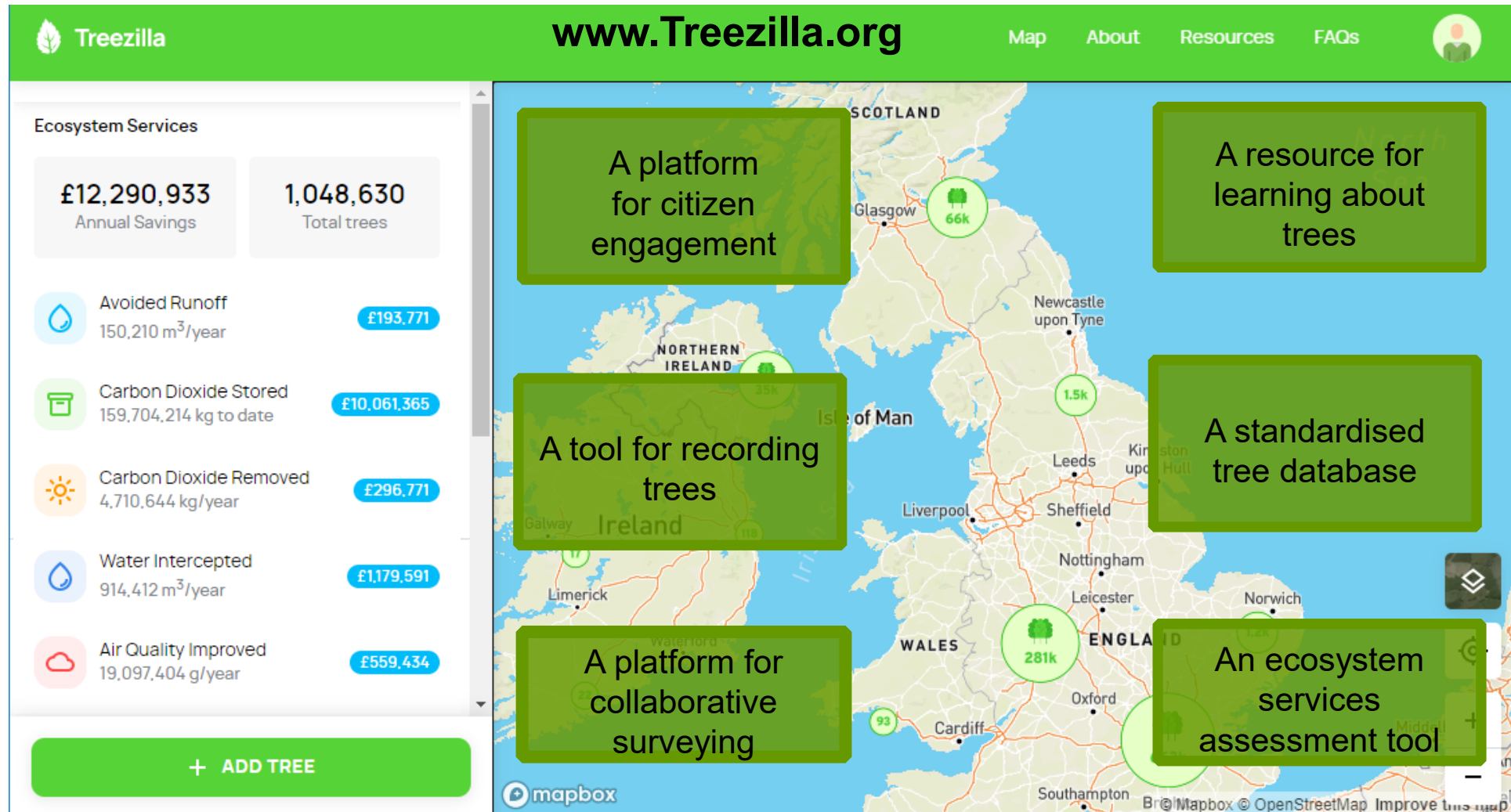


The screenshot shows the OpenLearn website interface. At the top, there's a navigation bar with 'OpenLearn' and 'Free Learning from The Open University'. A search bar is present with the text 'Search for free courses, interactives, videos and more!'. Below the navigation bar, there's a large banner image of a sea turtle with the text 'Dive in and start learning' and 'Everything on the multi-award winning OpenLearn is free to everyone!'. A secondary search bar is also visible. The main content area is divided into sections: 'Science, Maths & Technology', 'Featured content', 'Free courses', and 'All content'. The 'Free course' section highlights 'Citizen science and global biodiversity'. To the right, there's a sidebar with 'About this free course' (24 hours study, Level 1: Introductory), 'Create an account to get more', 'Become an OU student' (BA/BSc (Honours) Open degree), and 'Download this course' (Word, Kindle, PDF, Epub 2). The course description at the bottom states: 'This free course, *Citizen science and global biodiversity*, deals with the importance of biodiversity and explores how anyone can contribute to and be involved in identifying and recording wildlife, as a citizen scientist. It looks at what citizen science is, and how citizen science facilitates public involvement in scientific research activities as individuals learn and build skills. Traditional biological keys are introduced and online recording is demonstrated using citizen science techniques and practical activities using the [www.iSpotnature.org](http://www.iSpotnature.org) platform. The course goes on to demonstrate how, once a species is identified, web resources can be used to research its ecology. The role of citizen science is illustrated through a number of case studies from across the world. Finally, the course concludes by exploring the impact citizen scientists are having on recording biodiversity around the globe.'

- 
- 2.5 million user visits
  - 36 million pages viewed / 5 million sessions
  - >1.5 million images of >43,000 species
  - >806,000 observations
  - >9 million identifications
  - >2 million agreements with identifications
  - >75,000 registered users
  - 26,300 registered users added an observation
  - 16,400 registered users added an ID
  - ~10,000 users added an agreement to an ID
  - Reps from >200 expert orgs, schemes & societies
  - Hundreds of schools / teachers / representatives



# Creating a UK map of trees



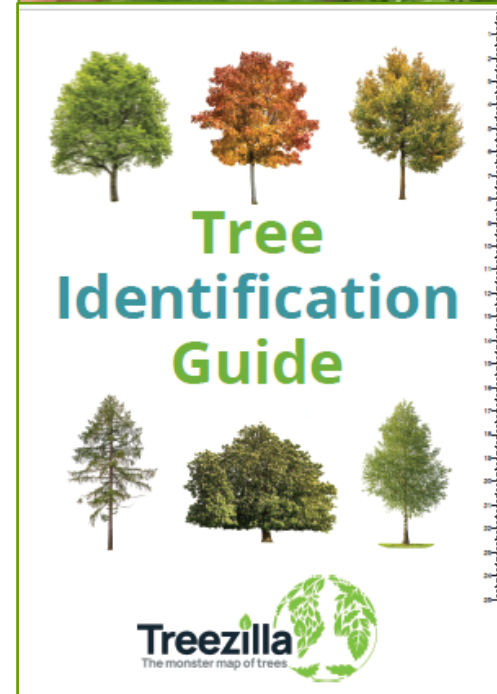
- Helps anyone learn about and map trees around them
- Highlights the role of trees in urban environments and the benefits they provide
- <1% of urban trees (outside woods) are in open maps – aims to fill this gap



Goal: UK's largest open tree map:

- 2013 – ongoing
- Over 1 million tree records
- 1000 registered users
- ~400 active users
- Most add 2-10 trees
- Users: public authorities, Tree Wardens, schools, Universities, public etc
- Records: 98% of records from local authority datasets
- Teaching: e.g. OU students collect local tree data; identify research questions
  - 2018 – 2019 >5000 trees added by >200 OU students

[www.Treezilla.org](http://www.Treezilla.org)  
Treezilla website, App  
and downloadable tools  
available!



Collaboration with **the Institute for Research in Schools (IRIS)** <https://researchinschools.org/> :

- IRIS develops opportunities for secondary students and post-16s from all backgrounds to participate in authentic research while in school.
- The IRIS Treezilla project offers a practical way for young people to uncover the impact of climate change on the natural world and make a contribution to the UK's tree canopy survey. Builds identification and classification skills, see: <https://researchinschools.org/projects/treezilla-2/>
- Science teacher encourages students at a girls school aimed at reducing their impact on the environment. Hear more about their experience using Treezilla to record tree data and find out the ecosystem service values: <https://researchinschools.org/case-studies/encouragement-in-science-leads-girls-to-become-changemakers-in-guernsey/>



**Trees – Planting a legacy for the future**  
Results, Analysis and Conclusion

**Results**  
Due to lockdown we didn't measure all the trees so we counted the trees and divided them into small, medium and large and took an average.

| Size of tree | No. of trees | Average CO <sub>2</sub> removed kg/year | Total CO <sub>2</sub> removed kg/year |
|--------------|--------------|---|---------------------------------------|
| L            | 25           | 50                                      | 1250                                  |
| M            | 25           | 25                                      | 125                                   |
| S            | 150          | 5                                       | 750                                   |
| <b>TOTAL</b> |              |   | <b>2125</b>                           |

**Analysis**  
Last year we measured the carbon footprint of the school = 110000 kg CO<sub>2</sub> per year  
Net carbon footprint = 110000 - 2125 = 107875 kg CO<sub>2</sub>/year  
To become carbon neutral we would have to plant 107875/25 = 4315 medium trees  
**Conclusion**  
It is not possible to plant so many trees on our small site so we will have to cut down on the number of cars travelling to school and flights if we want to become carbon neutral.

**Phase 1** | 4 Weeks timeframe  
Prepare & launch: Teachers prepare and launch the project, using our helpful guidance documents.

**Phase 2** | 4 Weeks timeframe  
Background research & skills development: With access to our support materials, students develop the knowledge and skills required to successfully complete research.

**Phase 3** | 8 Weeks timeframe  
Student Research: Young scientists systematically investigate, explore, discover, analyse and establish their conclusions.



Identify and classify.  
Treezilla offers a practical way for young people to uncover the impact of climate change on the natural world and make a contribution to the UK's tree canopy survey.

**Skill level**  
8 Beginner / Moderate

**Age suitability**  
12+

**Subject**  
BIOLOGY/  
ENVIRONMENTAL  
SCIENCE/ MATHS

*Watch to discover Treezilla*

**Project partner**  


Treezilla introduces students to the study of trees through hands-on learning.  
Young arborists take part in an ambitious project to map all of Britain's trees and record vital data about tree disease and the environmental benefits that trees provide. The map will be used for education, outreach and research purposes and UK's Biological Surveillance.

# X:PolliNation: ideas, methods & technologies for pollinator citizen science

**Drivers:** ‘**Cross-pollinating**’ ideas about how to improve and expand pollination citizen science tools and approaches **across geographic boundaries** and **stages of the actionable citizen science cycle**.

**Aim:** **Bringing together** young people, educators, technologists and scientists to learn about and protect pollinators

**Where:** UK (Hampshire/Sussex) and Italy (Tuscany)

**Who:**



**Funders:**



**Find us at:** [www.xpollination.org](http://www.xpollination.org) @XPolliProject #XPolli #PolliPromise

# XPoli actionable CS cycle

**X-Polli:Nation** is an actionable citizen science project designed to create awareness of environmental issues that surround pollinating insects, collect data on their feeding preferences for science, plant habitats to support them and finds novel ways to communicate their importance with a wider community.

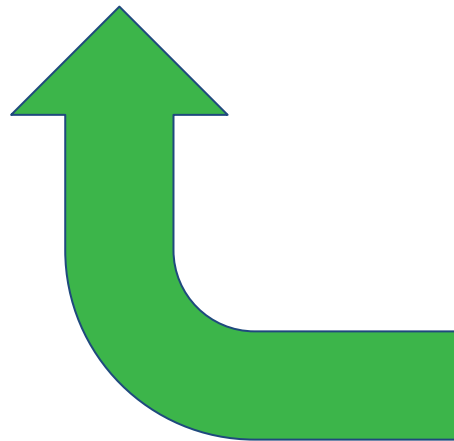
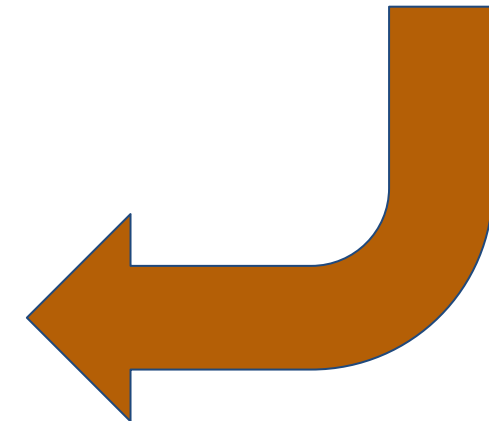
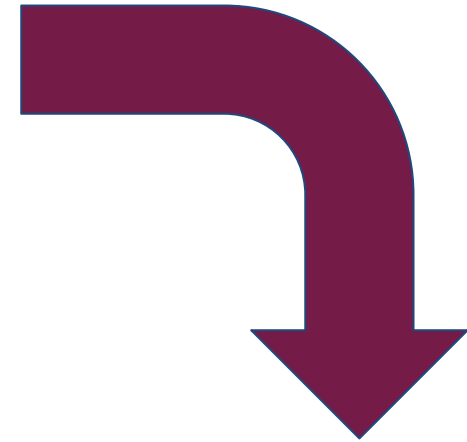
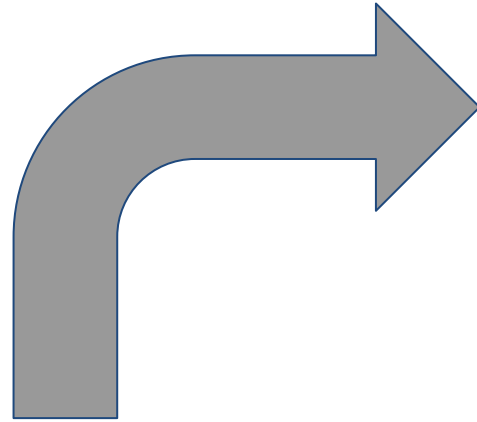
Share the idea with a Polli-Promise

Learn about pollinators



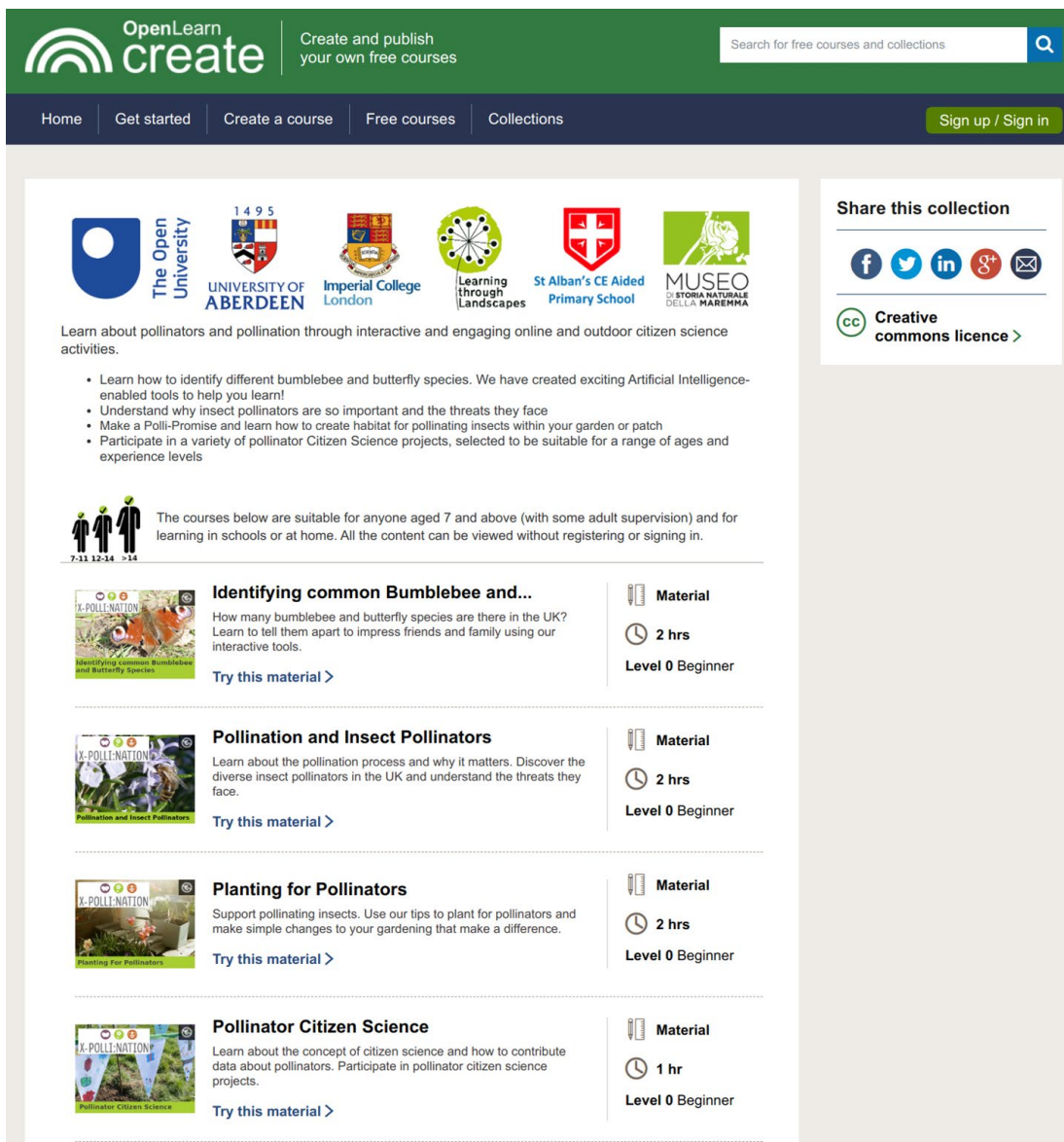
Record data about pollinator visits

Create or modify habitat in school grounds





# School-based experiences support: resources for all



**OpenLearn create** Create and publish your own free courses

Search for free courses and collections

Home Get started Create a course Free courses Collections Sign up / Sign in





**The Open University** **UNIVERSITY OF ABERDEEN** **Imperial College London** **Learning through Landscapes** **St Alban's CE Aided Primary School** **MUSEO DI STORIA NATURALE DELLA MAREMMA**

Learn about pollinators and pollination through interactive and engaging online and outdoor citizen science activities.

- Learn how to identify different bumblebee and butterfly species. We have created exciting Artificial Intelligence-enabled tools to help you learn!
- Understand why insect pollinators are so important and the threats they face
- Make a Polli-Promise and learn how to create habitat for pollinating insects within your garden or patch
- Participate in a variety of pollinator Citizen Science projects, selected to be suitable for a range of ages and experience levels

The courses below are suitable for anyone aged 7 and above (with some adult supervision) and for learning in schools or at home. All the content can be viewed without registering or signing in.

7-11 12-14 >14

| Thumbnail   | Title                                      | Description   | Material | Duration | Level            |
|---|--|---|----------|----------|------------------|
|    | <b>Identifying common Bumblebee and...</b> | How many bumblebee and butterfly species are there in the UK? Learn to tell them apart to impress friends and family using our interactive tools. | Material | 2 hrs    | Level 0 Beginner |
|   | <b>Pollination and Insect Pollinators</b>  | Learn about the pollination process and why it matters. Discover the diverse insect pollinators in the UK and understand the threats they face.   | Material | 2 hrs    | Level 0 Beginner |
|  | <b>Planting for Pollinators</b>            | Support pollinating insects. Use our tips to plant for pollinators and make simple changes to your gardening that make a difference.              | Material | 2 hrs    | Level 0 Beginner |
|  | <b>Pollinator Citizen Science</b>          | Learn about the concept of citizen science and how to contribute data about pollinators. Participate in pollinator citizen science projects.      | Material | 1 hr     | Level 0 Beginner |

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A Cross-pollinated resource for pollinator citizen science



Free course:

<https://www.open.edu/openlearncreate/course/index.php?categoryid=417>

- Creative Commons License
- Open Educational Resources (OER)

Geared at supporting teachers, see support and resources: <https://xpollination.org/teacher-resources/>



# Cos4Cloud, an European project to boost citizen science technologies



Integrate citizen science in the European Open Science landscape



Provide user-centered and innovative services to the citizen observatories



Facilitate the networking and knowledge management processes across organizations, people and initiatives working on citizen observatories



Contribute to ensuring the sustainability of the citizen observatories

[cos4cloud-eosc.eu](https://cos4cloud-eosc.eu)



COORDINATION



COLOMBIA



FRANCE



GERMANY



GREECE



NETHERLANDS



SPAIN



SWEDEN



UNITED KINGDOM



<https://cos4cloud-eosc.eu/blog/how-is-cos4cloud-boosting-citizen-science-technologies-watch-the-video/>

# What is a Citizen Observatory?

- Community-based monitoring and information system
- Usually oriented to environmental or biodiversity areas
- Usually embedded in portable or mobile personal devices (sensors, apps)
- Boost citizen engagement and participation
- Focus on improving the management of natural resources (flora, fauna, land)
- Collaborative approach

[cos4cloud-eosc.eu](https://cos4cloud-eosc.eu)

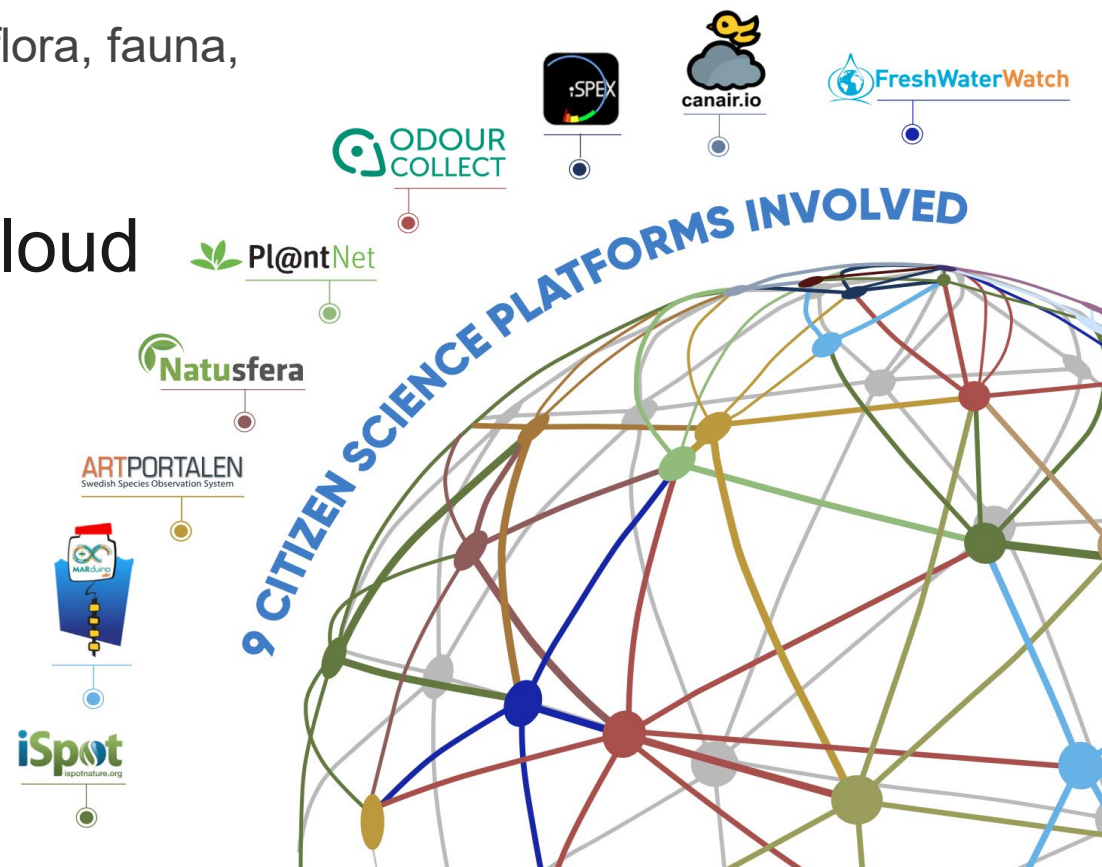
## Citizen Observatories involved in Cos4Cloud

Citizen observatories of the biodiversity domain:

- Artportalen
- Natusfera
- iSpot
- Pl@ntNet

Citizen observatories of environmental quality / monitoring domain:

- Water monitoring: FreshWater Watch, KdUINO
- Air monitoring: OdourCollect, CanAir.io and iSpex



\* Includes workpackage focused on: Networking, training, education and capacity building

# School-based experiences: Cos4Cloud

**What do the NKUA course's participants think about the training on citizen science? Read the statements and watch the videos!**

The objective of the NKUA online teacher training course was to introduce citizen science to key Greek environmental education stakeholders (teachers, officials and teacher training staff).



Photo: Key Greek environmental education stakeholders (teachers, officials, and teacher training staff) undertook the NKUA online teacher training course online.

Most of the participants had no previous experience with citizen science at all. Nevertheless, after having undertaken the course, all teachers and educational officials expressed their commitment to get involved with citizen science and implement the educational scenarios they developed into their school(s) under their responsibility. Some of their evaluative statements:



We share all our news and  
events in our newsletter.  
Subscribe to stay tuned!

[Subscribe now!](#)

**Integrating citizen science and Cos4Cloud into a Greek post-graduate course: an inside story**

Don't miss the story of Maria Kyriakidou, one of the students!

The Environmental Education Lab (EEL) of the National and Kapodistrian University of Athens (NKUA) organised, designed, and led the training course "[Citizen Science and Environmental Education for Sustainability](#)" within the Cos4Cloud framework. The objective was to introduce citizen science in the Greek school curriculum. Some of the students have wanted to share with us their experience doing this course. Don't miss the story of Maria Kyriakidou, one of the students!

**Introducing myself...**



Hi! My name is Maria Kyriakidou. I'm a Greek primary school teacher for the last 15 years. I really love my job since it has to do with supporting people, youths in particular, in becoming empowered and help grow citizens of the future. I like poetry, and I've just published my first collection of poems. I am also running an online art and science magazine ([Apodyoptes](#)) for the last five years.

Photo: Maria Kyriakidou.



We share all our news and  
events in our newsletter.  
Subscribe to stay tuned!

[Subscribe now!](#)

<https://cos4cloud-eosc.eu/blog/citizen-science-education-nkua-course/>

<https://cos4cloud-eosc.eu/blog/integrating-citizen-science-and-cos4cloud-into-a-greek-post-graduate-course-an-inside-story/>



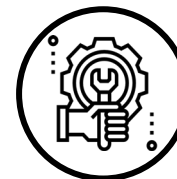
# Join the Cos4Cloud community!



**Co-designing**  
Create



**Panels**  
Advice



**Testing**  
Use

Join any of our groups and contribute to create the new generation of services for citizen observatories!

Fill this form to join us:

<https://cos4cloud-eosc.eu/be-part-of-our-community/>



JOIN OUR  
COMMUNITY!

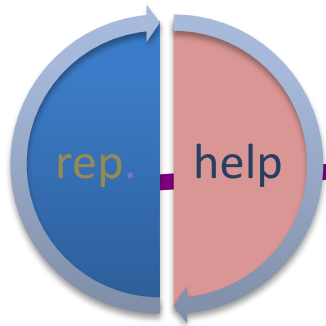
Keep informed: Follow **Cos4Cloud** on social media and visit our website: <https://cos4cloud-eosc.eu/>



Icons made by Eucalyp from [www.flaticon.com](http://www.flaticon.com)

# iSpot citizen science learning curve

*“By focusing on learning, iSpot not only helps participants generate valid scientific observations, but it also trains them to become the biological recorders on whom future data collection will depend.”*



Silvertown, J., Harvey, M., Greenwood, R., Dodd, M., Rosewell, J., Rebelo, T., Ansine, J., McConway, K. (2015). Crowdsourcing the identification of organisms: A case-study of iSpot. [ZooKeys, \(480\), 125.](#)





# CS learning design framed by a 5 step model:

## from exploration of nature through to recognised learning actions

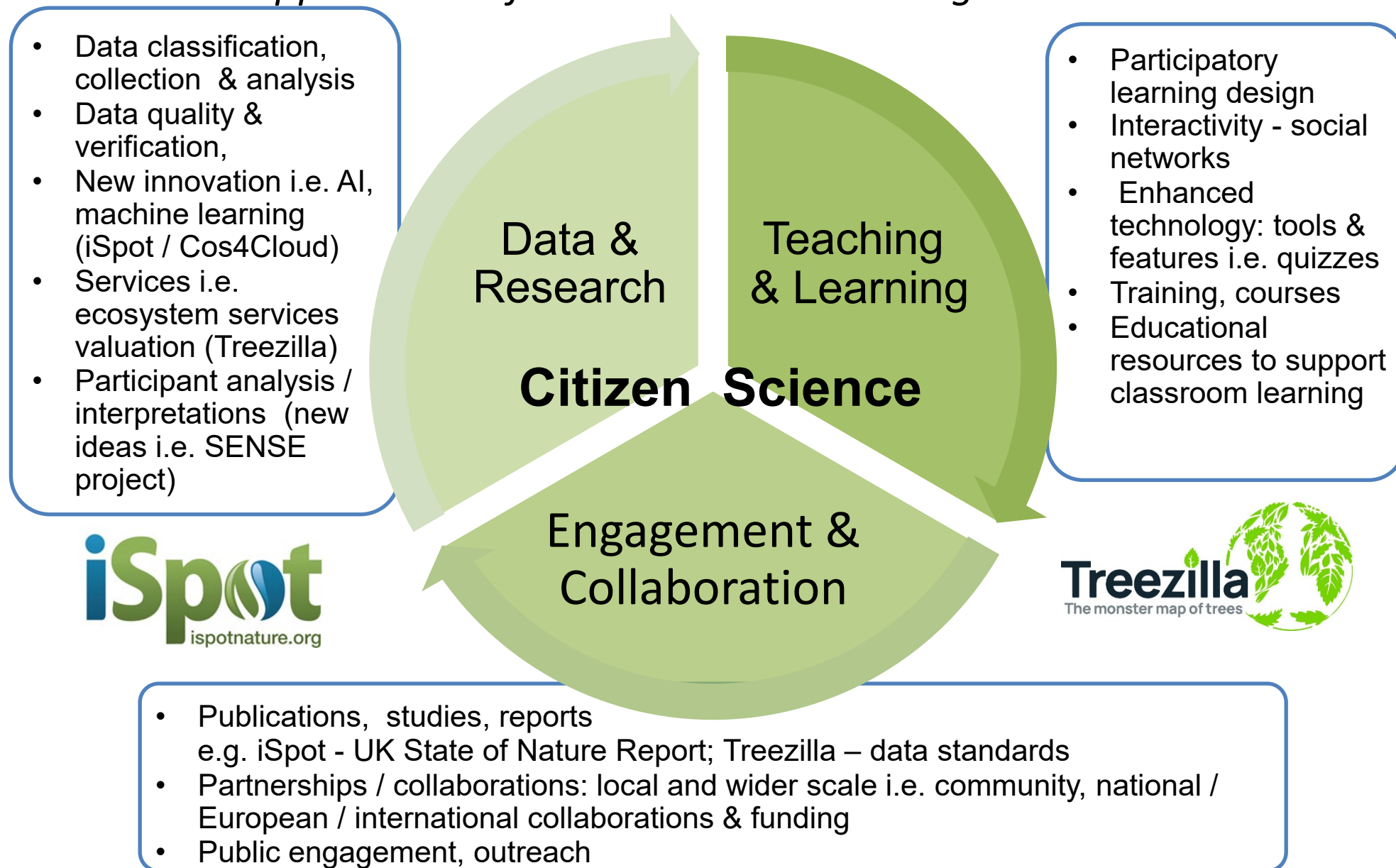
| Research themes    | Learning approaches    | iSpotnature.org user community experience / activity  | Research review and analysis (examples)   |
|--------------------|------------------------|---|---|
| <b>Explore</b>     | Social learning        | A free online platform - anyone can browse iSpot: analytics data shows users view an average of 9 pages per session with an average session duration of 8 – 10 minutes. | The potential for participant learner engagement from purposive browsing. i.e. iSpot's 'browse observation' search page was the second highest page viewed. (Ansine, et al. 2017) p87.  |
| <b>Identify</b>    | Participatory learning | Registered participants can post observations and photos; gather content, share comments and in doing so give and receive help with species identification.             | iSpot is described as having a "participatory learning" approach where as an "active participant" the learner engages in activity, developing their interest and passion" (Clow et al, 2011).   |
| <b>Contribute</b>  | Experiential learning  | iSpot integrates participant rewards and motivation through a bespoke reputation system.  | Registered participants gain scores for each of the species groups represented.<br>iSpot gives points and scores for activity and this is the key feature behind how the site works (Silvertown, et al. 2015).  |
| <b>Personalise</b> | Personalised learning  | iSpot has tools and features that encourage and facilitate personalisation to meet the participants' interest and pace (i.e. iSpot projects)                            | iSpot's design is described as one which gives participants control over the learning process (Scanlon et al. 2013) through integrated tools and features. Analysis of iSpot projects indicated that 3,000 were added in the first two years the feature was added (2014 – 2016) developed based on particular interest (Ansine et al. 2017). |
| <b>Recognition</b> | Active learning        | iSpot has integrated and bespoke learning assessment tools i.e. iSpot quizzes; and associated courses. iSpot Quiz data / structured courses projects data               | iSpot quizzes were integrated in 2013 as an assessment tool to support evidence of learning. A 2017 study indicated that over 35,000 quizzes were done over a 3-year period (Aug 2013 – Sept 2016). (Ansine et al. 2017). iSpot is also integrated into Open University formal learning and informal courses i.e. OpenLearn.                  |

[Ansine, Janice](#) (2021). Exploring citizen science learning journeys through iSpotnature.org: an online community of nature lovers. In: *CitSci Virtual 2021, Citizen Science Association (CSA) Conference*, 03-27 May 2021, Online (USA). <http://oro.open.ac.uk/78396/>

*Ansine, J., Dodd, M., Robinson, D., McAndrew, P., (2017) **Exploring citizen science and inquiry learning through iSpotnature.org**. Chapter 6 in Herodotou, C., Sharples, M., Scanlon, E. (eds) Citizen Inquiry: Synthesising citizen science and inquiry learning. Routledge.*

# Open University online citizen science learning communities

*opportunities for school-based learning*



Thanks to:

All associated project teams, funders and partners; past and current.

The tens of thousands of citizen scientists, experts and participants, who make these initiatives possible.

And a heartfelt thank you to you all for joining and participating today!

Interested in learning about citizen science? Already a keen nature observer, recorder or citizen scientist? Would you like to have your skills and contributions recognised?

A free Open University (OU) course is available:

[www.open.ac.uk/citizen-science-and-global-biodiversity](http://www.open.ac.uk/citizen-science-and-global-biodiversity)

Complete this course and get an OU Badge  and Statement of Participation!

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[www.treezilla.org](http://www.treezilla.org)  
[www.opensciencelab.ac.uk](http://www.opensciencelab.ac.uk)  
<https://cos4cloud-eosc.eu>  
<https://xpollination.org>